

WHAT IS CLAIMED IS:

- 1    1.    A method of producing a disinfecting solution comprising:
  - 2    (a) directing feed water into a dosing storage tank;
  - 3    (b) circulating the tank water from the dosing storage tank through one or more  
4    disinfectant containers and back into the dosing storage tank, the one or more  
5    disinfectant containers including a disinfectant with a predetermined rate of  
6    dissolution;
  - 7    (c) controlling the amount of feed water directed into the dosing storage tank to  
8    ensure that a circulation rate of the tank water does not exceed the rate of  
9    dissolution of the disinfectant; and
  - 10    (d) maintaining a substantially consistent concentration of disinfectant throughout  
11    the dosing storage tank.
- 1    2.    The method of claim 1, wherein step (c) further comprises measuring the  
2    total volume of feed water directed to the dosing storage tank.
- 1    3.    The method of claim 1 wherein the one or more disinfectant containers  
2    comprises at least one disinfecting vessel containing dissolvable disinfectant.
- 1    4.    The method of claim 1 further comprising the step of controlling the  
2    addition of feed water directed to the dosing storage tank by a pre-calculating the  
3    flow rate of feed water to match a predetermined dissolve rate for the dissolvable  
4    disinfectants.
- 1    5.    The method of claim 4, wherein step (d) further comprises maintaining a  
2    specific flow rate of feed water circulated throughout the one or more disinfectant  
3    containers to match a predetermined dissolve rate for the dissolvable  
4    disinfectants.

1 6. The method of claim 5 further comprising controlling the predetermined  
2 flow rate of the feed water directed to the dosing storage tank in conjunction with  
3 controlling the specific flow rate of the flow circulated from the dosing storage  
4 tank through the one or more disinfectant containers and back to the dosing  
5 storage tank to maintain a predetermined concentration of dissolvable  
6 disinfectant material within the water in the dosing storage tank.

1 7. The method of claim 4, wherein the dissolvable disinfectant comprises  
2 dissolvable tablets.

1 8. The method of claim 4, wherein the dissolvable disinfectant is comprised  
2 of a group of hypochlorites, the group selected from calcium hypochlorite, sodium  
3 hypochlorite and combinations thereof.

1 9. The method of claim 4, wherein the dissolvable disinfectant comprises  
2 bromine based chemicals, where necessary.

1 10. The method of claim 4 further comprising controlling the flow rate of  
2 additional feed water directed to the dosing storage tank in conjunction with  
3 controlling the specific flow rate of the flow circulated from the dosing storage  
4 tank throughout the one or more disinfectant containers to maintain a  
5 predetermined concentration of dissolvable disinfectant material within the water  
6 in the dosing storage tank.

1 11. The method of claim 1 further comprising monitoring the liquid level within  
2 the dosing storage tank.

1 12. The method of claim 11 further comprising determining a make-up set  
2 point within the dosing storage tank and adding make-up water to the dosing  
3 storage tank when the liquid level within the dosing storage tank falls below the  
4 make-up set point.

1 13. The method of claim 10 further comprising determining a high level set  
2 point and ceasing water flow into the dosing storage tank when the liquid level  
3 within the dosing storage tank exceeds the high level set point.

1 14. The method of claim 10 further comprising determining a low level set  
2 point and ceasing circulation from the dosing storage tank when the fluid level  
3 within the dosing storage tank falls below the low level set point.

1 15. The method of claim 1 re-circulating the fluid within the dosing storage  
2 tank thereby preventing settling out of particulate materials within the fluid.

1 16. The method of claim 1, wherein the controlling step comprises monitoring  
2 the amount and flow rate of feed water added to the dosing storage tank,  
3 comparing the amount of feed water added to the dosing storage tank with the  
4 amount of fluid required to match the disinfecting capabilities of the disinfectant  
5 within the one or more disinfectant containers, ceasing the addition of feed water  
6 to the dosing storage tank when the amount of feed water added to the dosing  
7 storage tank matches the disinfecting capabilities of the disinfectant within the  
8 one or more disinfectant containers.

1 17. The method of claim 16 further comprising recharging the disinfecting  
2 capabilities of the disinfectant within the one or more disinfectant containers.

1 18. The method of claim 1 wherein the feed water collected within the dosing  
2 storage tank is softened water.

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1 19. The method of claim 1 further comprising maintaining from about 0.2% by  
2 weight hypochlorite to about 10.0% by weight of hypochlorite in the disinfected  
3 solution within the dosing storage tank.

4 20. The method of claim 1 further comprising maintaining about 0.9% by  
5 weight of hypochlorite solution in the disinfected solution within the dosing  
6 storage tank.

1 21. The method of claim 1 further comprising flowing a disinfecting solution  
2 from the dosing storage tank to at least one user of disinfecting solution.

1 22. A method of producing a disinfecting solution comprising:

2 (a) directing feed water into a dosing storage tank;

3 (b) circulating the tank water from the dosing storage tank through one or  
4 more disinfectant containers and back to the dosing storage tank, wherein  
5 the one or more disinfectant containers contains a dissolvable disinfectant;

6 (c) controlling the flow rate of the feed water directed to the dosing storage tank  
7 and the flow rate of the tank water circulating from the dosing storage tank  
8 through one or more disinfectant containers to match a predetermined  
9 dissolve rate of the disinfectant.

1 23. The method of claim 22 further comprising flowing a disinfecting solution  
2 from the dosing storage tank to at least one user of a disinfecting solution.

1 24. The method of claim 22 further comprising monitoring the liquid level  
2 within the dosing storage tank.

1 25. The method of claim 24 further comprising determining a make-up set  
2 point within the dosing storage tank and adding make-up water to the  
3 dosing storage tank when the liquid level within the dosing storage tank  
4 falls below the make-up set point.

- 1 26. The method of claim 24 further comprising determining a high level set  
2 point and ceasing water flow into the dosing storage tank when the liquid  
3 level within the dosing storage tank exceeds the high level set point.
- 1 27. The method of claim 22 further comprising determining a low level set  
2 point and ceasing circulation from the dosing storage tank when the fluid  
3 level within the dosing storage tank falls below the low level set point.
- 1 28. The method of claim 22 wherein the flow rate of the additional feed water  
2 directed to the dosing storage tank is predetermined to match the dissolve  
3 rate of the disinfectant and the flow rate of the water circulated through the  
4 one or more disinfectant containers is a different predetermined flow rate.
- 1 29. The method of claim 22 further comprising circulating the fluid within the  
2 dosing storage tank thereby preventing settling out of particulate materials  
3 within the fluid.
- 1 30. The method of claim 22, further comprising controlling the flow rate of the  
2 feed water directed to the dosing storage tank in conjunction with  
3 controlling the flow rate of the flow circulated from the dosing storage tank  
4 through the one or more disinfectant containers to maintain a  
5 predetermined concentration of dissolvable disinfectant material within the  
6 water in the dosing storage tank.
- 1 31. The method of claim 22, further comprising the step of directing an effluent  
2 stream to a user, the effluent stream comprising about 0.2 weight percent  
3 of a hypochlorite solution to about 10.0 weight percent of a hypochlorite  
4 solution.
- 1 32. The method of claim 22, wherein the dissolvable material is selected from  
2 a group comprising calcium hypochlorite, sodium hypochlorite, and a  
3 combination thereof.

1 33. The method of claim 22 wherein the feed water directed to the dosing  
2 storage tank comprises softened water.

3 34. A method of producing a disinfecting solution comprising:

4 (a) directing feed water to a dosing storage tank;

5 (b) circulating the water within the dosing storage tank from the dosing  
6 storage tank through one or more disinfectant containers and back into the  
7 dosing storage tank, wherein the one or more disinfectant containers  
8 includes a dissolvable disinfectant;

9 (c) monitoring the amount of feed water added to the dosing storage tank;

10 (d) comparing the amount of feed water added to the dosing storage tank with  
11 the amount of fluid required to match the disinfecting capabilities of the  
12 disinfectant within the one or more disinfectant containers;

13 (e) ceasing the addition of feed water to the dosing storage tank when the  
14 amount of feed water added to the dosing storage tank matches the  
15 disinfecting capabilities of the disinfectant within the one or more  
16 disinfectant containers;

17 (f) controlling the flow rate of the feed water directed to the dosing storage  
18 tank in conjunction with controlling the flow rate of the flow circulated from  
19 the dosing storage tank through the one or more disinfectant containers to  
20 match a predetermined dissolve rate of dissolvable disinfectant material  
21 within the solution in the dosing storage tank to ensure that the circulation  
22 rate of the tank water does not exceed the rate of dissolution of  
23 disinfectant.

- 1 35. The method of claim 34 further comprising, flowing the disinfecting  
2 solution from the dosing storage tank to at least one user of disinfected  
3 water.
- 1 36. The method of claim 34 further comprising monitoring the liquid level  
2 within the dosing storage tank.
- 1 37. The method of claim 36 further comprising determining a make-up set  
2 point within the dosing storage tank and adding make-up water to the  
3 dosing storage tank when the liquid level within the dosing storage tank  
4 falls below the make-up set point.
- 1 38. The method of claim 36 further comprising determining a high level set  
2 point and ceasing water flow into the dosing storage tank when the liquid  
3 level within the dosing storage tank exceeds the high level set point.
- 1 39. The method of claim 36 further comprising determining a low level set  
2 point and ceasing circulation from the dosing storage tank when the fluid  
3 level within the dosing storage tank falls below the low level set point.
- 1 40. The method of claim 39, wherein the disinfectant comprises dissolvable  
2 tablets.
- 1 41. The method of claim 34 further comprising circulating the fluid within the  
2 dosing storage tank thereby preventing settling out of particulate materials  
3 within the fluid.
- 1 42. The method of claim 34 wherein the feed water directed to the dosing  
2 storage tank is softened water.
- 1 43. A method of producing a disinfecting solution comprising:

2 (a) directing feed water into a dosing storage tank, the feed water comprising  
3 softened water;

4 (b) circulating tank water from the dosing storage tank through one or more  
5 disinfectant containers and back to the dosing storage tank, wherein the one or  
6 more disinfectant containers contains a dissolvable disinfectant;

7 (c) controlling the flow rate of the feed water directed to the dosing storage  
8 tank to match a predetermined dissolve rate of the disinfectant.

9 (d) re-circulating the fluid within the dosing storage tank thereby preventing  
10 settling out of particulate materials within the fluid.

1 44. A system for producing a disinfecting solution comprising:

2 a dosing storage tank fillable with a feed water;

3 one or more disinfectant containers comprising a dissolvable disinfectant,  
4 the one or more disinfectant containers in fluid communication with the dosing  
5 storage tank;

6 a pump in fluid communication with the dosing storage tank and the one or  
7 more disinfectant containers, the pump capable of providing a circulating flow  
8 between the dosing storage tank and the one or more disinfectant containers;  
9 and

10 a controller system capable of controlling the rate of feed water flow  
11 directed into the dosing storage tank and the rate of tank water circulated to the  
12 disinfectant container to match the dissolve rate of the disinfectant.



1 45. The system of claim 44 wherein the flow rate of feed water into the dosing  
2 storage tank differs from the flow rate of the tank water circulating to and  
3 from the disinfectant container.

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1 46. The system of claim 44 wherein the feed water comprises softened water.

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1 47. The system of claim 44 further comprising a level controller capable of  
2 monitoring the liquid level within the dosing storage tank.

1 48. The system of claim 47 wherein the level controller is in operative  
2 communication with the controller system and the system further comprises a  
3 high level set point and a low level set point.

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1 49. The system of claim 44, wherein the dissolvable disinfectant is selected  
2 from a group of disinfectants comprising calcium hypochlorite, sodium  
3 hypochlorite, and combinations thereof.

4 50. The system of claim 44 comprising an effluent stream directed to a user,  
5 the effluent stream comprising from about 0.2% by weight of hypochlorite to  
6 about 10.0% by weight of hypochlorite.

1 51. The system of claim 44 comprising an effluent stream directed to a user,  
2 the effluent stream comprising about 0.9% by weight of hypochlorite.